## Remarks

### Objections to the Specification

The Office Action objected to the abstract of the disclosure as not defining the term "SCA-2" at its first recitation. Applicants have amended the abstract to include the definition (spinocerebellar ataxia 2), as suggested by the Office Action, and thus the objection is believed to be obviated.

### Objections to the Claims

Claim 1 was objected to because it did not define the term "SCA-2" at its first recitation. Because applicants have canceled claim 1, the objection is moot with respect to claim 1. In addition, applicants have amended claim 11 to define "SCA-2" at its first recitation, and therefore believe to have overcome the objection.

### Double-Patenting Rejections of Claims 1-8, 16-19

Claims 1-8 and 16-19 have been rejected as being unpatentable over claims 34 and 35 of U.S. Patent No. 6,515,197, claims 4 and 7 of U.S. Patent No. 6,844,431. Claims 1, 7, 16-19 have been provisionally rejected as being unpatentable over claims 13-15 of co-pending Application No. 10/141,541, while Claims 1-8, 16-19 have been provisionally rejected over claims 1, 2 and 7 of co-pending Appication No. 10/750,323. Because applicants have canceled claims 1-8 and 16-19, these rejections are now moot.

### Claim Rejections under 35 U.S.C. §101

Claims 1-8, 11, 12, 17-24 and 26 have been rejected as being directed to non-statutory subject matter for reciting SCA-2 polynucleotide which could comprise the native SCA-2 gene as a product of nature. Because claims 1-8 and 17-19 have been canceled, the rejection is moot with respect to these claims. Applicants have amended claims 11 and 12 to recite an "isolated"

SCA-2 nucleotide, as suggested by the Office Action. Amended claim 20 recites a vector comprising an expression cassette encoding a human SCA-2 therapeutic, and thus does not read on a native gene or product of nature. Because claims 21-24 depend from claim 20, they likewise do not read on native genes. Claim 26 depends from claim 25 which recites a plasmid comprising an expression cassette encoding a human SCA-2 therapeutic, and thus does not read on the native gene or protein. Claim 24 has been amended to recite a method, and thus no longer reads on a cell within a human.

**Claim Rejections under 35 U.S.C. §112, First Paragraph**

Claims 11, 12, 20-31 have been rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the enablement requirement. The Office Action held that claims 11, 20, and 25 encompassed administration of SCA-2 from any organism to any organism, even organisms distinct from that being treated. Applicant has amended claims 11, 20 and 25 to recite the administration of human SCA-2 to a human and therefore believes to have obviated this ground of the rejection. The Office Action further held that because the specification discloses no working examples demonstrating that administration of SCA-2 have any effect on weight gain in any organism, an artisan would face undue experimentation in practicing the claimed invention. Applicant respectfully submits that the experimentation required to practice the instant invention is neither complex nor undue, and that a person of skill in the art would have a reasonable expectation of success.

This is evidenced by the declaration which accompanies this response. The declaration by Dr. Pulst ("Pulst Declaration"), at paragraphs 5-7 outlines the experimental setup to determine the effect of SCA-2 administration in the mouse model for obesity. Because the experimental design is straightforward and routinely performed in laboratories such as Dr. Pulst's, it can be

readily performed by a person of skill in the art. Furthermore, a person of skill in the art would have a reasonable expectation of success, as SCA-2 deficiency produces an obese phenotype even in the heterozygous state ($Sca2^{+/-}$), thereby clearly implicating SCA-2 deficiency in the development of obesity.

It is further noteworthy that the SCA-2 deficient obese phenotype occurs in mice of mixed genetic background, thus paralleling the genetic diversity of humans. Significantly, the obese phenotype in the SCA-2 deficient mice is a result of marked overeating, which is also characteristic of obesity in humans. Not surprisingly, preliminary data have already indicated that SCA-2 is in fact implicated in human obesity (Pulst Declaration, ¶11). The SCA-2 deficient obese phenotype is, strictly speaking, not a metabolic phenotpe at all, and thus not subject to the same susceptibilities to genetic background and environmental factors as the Office Action asserts for metabolic phenotypes (Office Action 1/17/06 at p. 14). Based on this evidence, it is more than reasonable to expect that treating SCA-2 deficiency will lead to an amelioration of obesity in SCA-2 deficient subjects.

The Office Action further asserted the unpredictability of the art of gene therapy as a grounds for the lack of enablement rejection. In support of its position, the Office Action cited an excerpt by Gardlick et al. (Office Action 1/17/2006 at p. 16) Applicant respectfully notes that the excerpt quoted by the Office Action refers to the limitations of gene therapy in "***routine*** clinical use" (emphasis added), and is thus a generalization of a vast number of gene therapeutic approaches, some of which have been successful in the clinical setting, while others require further improvement. A blanket rejection based on the unpredictability of gene therapy is therefore inappropriate, since many conditions have been shown to be treatable by gene and/or protein delivery approaches. Applicant further respectfully submits that gene therapy has made

considerable progress in recent years, as acknowledged in the presentation by USPTO Supervisory Patent Examiner Karen Hauda (Art Unit 1632), available at www.uspto.gov/web/patents/biochempharm/documents/gene.pps. The same presentation points out that the USPTO does not require clinical data to prove enablement (emphasis in original).

The Office Action also held that the specification primarily failed to establish a clear nexus between over-expression of SCA-2... and reduction or treatment of obesity (Office Action, 1/17/06 at p. 16). Applicant respectfully submits that it is not the overexpression of SCA-2 that is expected to yield the therapeutic benefit of reducing obesity, but rather the correction of SCA-2 deficiency. Because the scientific data evidences a direct nexus between SCA-2 deficiency and the development of obesity through overeating (Pulst Declaration, ¶¶ 4, 11), the correction of SCA-2 deficiency is reasonably expected to lead to a reduction in obesity. Neither the administration of SCA-2 in protein or nucleotide form nor the determination of its effect on the obese phenotype pose any undue difficulty to the person of skill in the art. Accordingly, applicant respectfully submits that the pending claims are fully enabled.

**Claim Rejections under 35 U.S.C. §112, Second Paragraph**

Claims 2, 11, 20-22 stand rejected under 35 U.S.C. §112, second paragraph, for being indefinite. Claim 2 has been canceled, and thus the rejection is moot as to this claim. Claim 11 has been amended to recite the step of administering the pharmaceutical composition to a human, and thus now recites a positive step. Claim 20 has been amended to recite a positive step and to eliminate dependency from canceled claim 19. Claim 25 has been amended to recite transfecting a cell of said human, thereby reciting a positive step. Claims 21 and 22 have been amended to recite the "transducing" to conform with claim 20. Accordingly, Applicant respectfully requests that the rejections be withdrawn.

**Rejections under 35 U.S.C. §102(b)**

Claims 1-8, 16-19 have been rejected under U.S.C. §102(b) as being anticipated by Pulst et al. (US Patent No. 6,515,197). Because applicant has canceled claims 1-8 and 16-19, the rejection is now moot with respect to said claims.

For the foregoing reasons, applicant respectfully requests that the claims under consideration be allowed.

Respectfully submitted,

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